abundance and the microturbulent velocity. The trajectories in the $m_1, (b-y)$ plane resulting from either of these variations are similar and difficult to distinguish observationally. The trajectories in the $c_1, (b-y)$ plane, however, differ significantly, and in some cases this may allow these two atmospheric effects to be distinguished by the photometry alone.

On the other hand, the effects of evolution considerably complicate the interpretation of the photometric differences between the clusters; and only if the initial helium abundance of the clusters is known can these differences be explained in terms of abundance or microturbulence anomalies.

**A New Model of Photospheric Faculae.** G. A. Chapman, The Aerospace Corporation, El Segundo, Calif.—Published and newly observed facular contrast measurements were used in constructing physical models of faculae. On the basis of other observations, the typical horizontal size was taken to be 750 km, independent of depth. Trial models were constructed and their center-to-limb contrast was computed and compared with the observations. The model having best agreement with observations was then adopted.

This adopted model has an extrapolated temperature of $\approx 1.5 \times 10^4$ K above that of the surrounding atmosphere, at a height of $\approx 4 \times 10^3$ km above $\tau_{0005} = 1$.

**Alignment of an Oblique, Spheroidal Rotator.** W. Y. Chau and R. N. Henriksen, Astronomy Group, Physics Dept., Queen's University, Kingston, Ontario.—The evolution of an oblique, spheroidal rotator has been studied with both gravitational and magnetic radiation included. The general relativistic effects are calculated within the weak-field approximation and the electromagnetic radiation is assumed to be emitted into a vacuum. If the deceleration parameter $n$ is really significantly greater than 3 (Boytoun, P. E., Groth, E. J. III, Partridge, R. B., and Wilkinson, D. T. 1969, Ap. J. Letters 157, L197), then it is found that the combined requirements of age fitting, significant eventual slow down of the spin, and a maximum $n$ determines the “best” model remarkably well. This model has a present $n \approx 3.51$, an obliquity of $\approx 84.7^\circ$, an eventual slow down of the angular velocity to about 3 Hz, and, depending on the neutron star models used, radiates at the rate of $10^{37-38}$ ergs per sec, of which $\approx 30\%$ is in the form of gravitational radiation.

**Intensity and Diameter Ratios in Double Radio Galaxies.** Wayne Christiansen, Joint Institute for Laboratory Astrophysics, Boulder, Colo.—The symmetry of radio galaxy explosions can be studied by comparing observed intensity, distance, and component diameter ratios with the same quantities computed from generalized relativistic, inertial confinement models.

Unless the galactic explosion is fully symmetrical (i.e., the initial radii, velocities, and masses of both radio components are equal), the effects of retardation across the source cannot be separated from intrinsic differences in the rate of evolution of each component. Therefore, radio source age and velocity estimates, based on the assumption that the observed differences in the separation of the two components from the parent galaxy are only due to differences in the light travel time across the source, are subject to large uncertainties.

It is shown that ejection of radio source components at extreme relativistic velocities $[1-(v/c)\simeq 1]$ can be ruled out on the basis of existing observational data, without invoking arguments based on the excessive energy required to accelerate massive clouds to velocities near the speed of light: the possibility of mildly relativistic ejection ($v \lesssim 0.9c$) of plasma clouds cannot be eliminated, although the intrinsic variation in source parameters required to explain the observational data on intensity and diameter ratios is as large as in the nonrelativistic case.

**An Observational Test to Distinguish the Mode of Chromospheric Oscillation.** Alfred Clark, Jr., Patricia André Clark, and John H. Thomas, Department of Mechanical and Aerospace Sciences, University of Rochester, Rochester, N. Y.—Although the chromospheric oscillations are believed to be associated with waves generated by penetrative convection, the identification of the wave mode (or modes) excited is still uncertain. Two suggestions which have received considerable attention are trapped internal gravity waves and trapped acoustic waves. Both of these waves are dispersive in their horizontal propagation, so that the disturbance generated by a single rising granule will, in time, be resolved into an expanding cylindrical wave train. The response of the atmosphere at points away from the center of the initial disturbance is a harmonic wave with a slowly varying amplitude and period. The observed period depends only on the dispersion relation for the wave mode. It is shown that for velocity records at a single point, the period should increase with time for trapped acoustic modes and decrease with time for trapped gravity modes. In addition, the dispersion is less for sound waves, so that the duration of the signal produced by a single granule is considerably less for a sound wave than for a gravity wave. These